

## Scientific Session V: Aortic II

### Cohort-Comparison of Thoracic Endovascular Aortic Repair with Open Thoracic Aortic Repair Using Modern End-Organ Preservation Strategies

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**Objectives:** Pivotal trials showed that thoracic endovascular aortic repair (TEVAR) has improved outcomes compared with open surgery for treating descending thoracic aortic aneurysms. However, those trials included historical open controls in which modern end-organ preservation strategies were not routinely employed. In an effort to create a more level assessment, we compared our outcomes of TEVAR with modern open thoracic aortic repair (OTAR) controls.

**Methods:** A retrospective review of a prospective database of thoracic aortic aneurysm patients undergoing TEVAR was compared with a contemporaneous cohort of OTAR patients. Partial bypass or hypothermic circulatory arrest (HCA) was used in all OTAR patients. Both groups underwent cerebrospinal fluid (CSF) drain placement when feasible. Preoperative characteristics, operative variables, and outcomes were recorded, and the Kaplan-Meier method was used for 1-year survival estimates. Subgroup analysis was performed using length of aortic stent graft coverage or length of aortic replacement.

**Results:** During the study period (2002-2013), 81 patients underwent TEVAR and 61 underwent OTAR with median follow-up of 23.7 months (interquartile range, 6.7-55.1) and 36.4 months (interquartile range, 9.6-60.2), respectively. TEVAR patients had significantly lower 30-day mortality (2.5% vs 13.1%;  $P = .02$ ) and fewer complications including pneumonia ( $P = .01$ ) and rebleeding ( $P = .03$ ). However, there was no difference in permanent spinal cord ischemia (SCI) (1% vs 2%;  $P = .9$ ) or estimated 1-year survival ( $P = .9$ ). Among OTAR patients, HCA tended to have higher 30-day mortality (16% vs 7%,  $P = .43$ ). Cox regression revealed that advanced age and higher baseline creatinine levels were associated with greater hazard of 1-year mortality; TEVAR and CSF drain placement were protective of 1-year survival. For patients with <20 cm of aortic stent graft or aortic graft replacement, there was no difference in 30-day mortality ( $P = .07$ ) or permanent SCI (TEVAR  $n = 0$ , 0% vs OTAR  $n = 1$ , 2%;  $P = .9$ ). For those with  $\geq 20$  cm of aortic stent graft or replacement, there was no difference in 30-day mortality ( $P = .9$ ) or permanent SCI (TEVAR  $n = 1$ , 2% vs OTAR  $n = 0$ , 0%;  $P = .9$ ).

**Conclusions:** TEVAR continues to show improved perioperative outcomes with decreased 30-day mortality and fewer major adverse events compared with OTAR. However, with the advent of routine end-organ preservation during OTAR, SCI can be safely reduced to comparable levels with those of TEVAR. Length of aortic stent graft coverage or length of surgical graft replacement does not significantly impact outcomes.

### Outcomes of Open Surgical Repair for Chronic Type B Aortic Dissections

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**Objectives:** Open surgical repair (OSR) for chronic type B aortic dissections (CTBAD) has an associated morbidity and mortality. The role of thoracic endovascular aneurysm repair (TEVAR) in CTBAD has not been determined. We analyzed our contemporary experience of CTBAD undergoing OSR to identify high-risk patients that may be considered for TEVAR.

**Methods:** From 1999-2010, 221 patients had repair of descending thoracic and thoracoabdominal aortic aneurysms, including 86 patients with CTBAD. We analyzed this cohort for mortality, complications, length of stay, and reinterventions.

**Results:** OSR was performed in 25 (29%) and 61 (71%) patients for descending thoracic and thoracoabdominal CTBAD, respectively. Mean age was 58.4 years ( $\pm 10.4$ ) and mean diameter 6.2 cm ( $\pm 1.1$ , 4.1-10.0). Fifty-nine (69%) patients were male. Eight (9%) were treated for rupture. Mean duration of follow-up was 5.2 years ( $\pm 2.7$ ). Hospital mortality occurred in five (5.8%) patients. Cardiopulmonary bypass was used in 83 (97%) and deep hypothermic arrest in 36 (42%) patients. Paraplegia occurred in two (2.3%), stroke in two (2.3%), and renal failure requiring permanent hemodialysis in two (2.3%) patients. Average length of stay was 19.6 days ( $\pm 17.8$ ). Univariate predictor of hospital mortality included redo-operations and prolonged pump time ( $P < .05$ ). Maximum aneurysm diameter and rupture at presentation trended toward significance. Twenty

(24.7%) patients of the 81 survivors died during follow-up (mean,  $62.5 \pm 36$  months). Six patients (7%) had aortic related reoperations at a mean of 3.8 years ( $\pm 1.8$ ): one for ascending and five for descending aortic aneurysms. Overall survival at 1, 5, and 7 years was 92%, 83%, and 70%, respectively. Freedom from reoperation was 99%, 90%, and 86%, respectively.

**Conclusions:** OSR of CTBAD is a durable option with low mortality. Patients requiring redo-operations or anticipated prolonged pump time need further evaluation to determine whether conventional OSR or TEVAR, if feasible, is the optimal treatment option.

### Outcomes for Ruptured AAA (REVAR And Open AAA Repair) Are Favorable if Performed by Vascular Surgeons Compared with General Surgeons

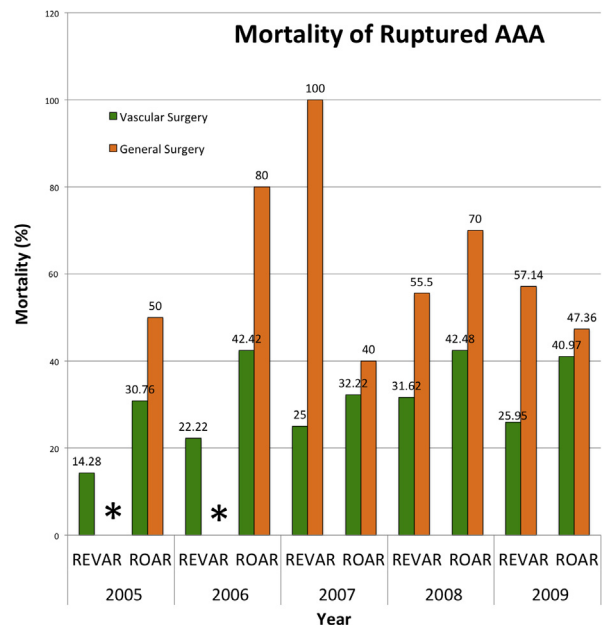
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**Objectives:** Open repair for ruptured AAA (ROAR) has been the standard treatment. Vascular surgeons (VS) have pioneered REVAR over past two decades. Gradually, general surgeons (GS) have also learned this technique. The purpose of this study was to review the nationwide trends among specialties performing operations for rAAA and outcomes.

**Methods:** American College of Surgeons-National Surgical Quality Improvement Program database was searched for surgeries performed for rAAA during 2005-2009. Patients' demographics and comorbidities (diabetes mellitus, hypertension, chronic obstructive pulmonary disease, congestive heart failure, myocardial infarction, dialysis dependency, peripheral artery disease) were collected. Operations performed by VS and GS were identified. We also collected American Society of Anesthesiologists scores, operating times, lengths of hospital stay, postop complications and mortality.

**Results:** A total of 1354 patients were identified. Mean age, 71 years, 82% male. Comorbidities: diabetes mellitus (14%), smoking (43%), chronic obstructive pulmonary disease (18%), congestive heart failure (14%), myocardial infarction (1.4%), hypertension (75%), dialysis (1%), and peripheral artery disease (6%). ROAR was performed in 978 (72%) and REVAR in 376 (28%) patients. Average operating time: 194 minutes (ROAR) vs 177 minutes (REVAR). GS performed 0% of REVARs in 2005, which increased to 6% in 2009. Mortality of REVAR was 26% (VS) and 59% (GS) ( $P = .021$ ); mortality for ROAR was 36% (VS) and 52% (GS) ( $P = .019$ ) (Fig). The average operating times (minutes) for REVAR were 178 (VS) and 205 (GS); for ROAR they were 190 (VS) and 200 (GS).

**Conclusions:** Vascular surgeons established REVAR as a standard therapy but are gradually performing less of it, which may reflect the increasing level of comfort of general surgeons. Thirty-day mortality is favorable if VS perform the operation.



\* No REVARs by general surgeons in 2005 & 2006

Fig.